



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

11.7

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/722,531

11/28/2003

Akira Hamamatsu

520.43302X00

7610

20457

7590

07/31/2006

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

STAFIRA, MICHAEL PATRICK

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/722,531	HAMAMATSU ET AL.	
	Examiner	Art Unit	
	Michael P. Stafira	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed 5/26/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-13 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4, 5, 10 and 12 is/are allowed.
- 6) ☒ Claim(s) 6, 7, 9 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 8, 11 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 6, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin ('674).

Claim 6, 7

Lin ('674) further discloses an illumination optical system (Fig. 5, Ref. 60) which illuminates light to an object (Fig. 5, Ref. 10) under inspection; a detection optical system (Fig. 5, Ref. 90) which detects light reflected from said object (Fig. 5, Ref. 10) and converts the detected light into an image signal; a spatial filter (Fig. 5, Ref. 28) which is provided in said detection optical system to selectively shield diffracted light pattern coming from a circuit pattern existing on the object by combining light-shielding points of minute dots state (Col. 8, lines 39-60); an arithmetic processing system (Fig. 5, Ref. 96) which processes the image signal detected by said detection optical system (Col. 8-9, lines 61-7); a spatial filter is provided by printing a Fourier transformed image of the circuit pattern as the diffracted light pattern to selectively shield (Col.

Art Unit: 2877

8, lines 39-60) (Further printing a image on the filter is well known in the art.); wherein said detection optical system comprises a Fourier transform lens (Fig. 5, Ref. 66) which Fourier transforms the diffracted light reflected from the circuit pattern of said object (Fig. 5, Ref. 10), and an inverse Fourier transform lens (Fig. 5, Ref. 88) which inverse Fourier transforms light obtained through said spatial filter (Fig. 5, Ref. 28). Lin ('674) further discloses a stage (Fig. 7, Ref. 98), which mounts an object (Fig. 7, Ref. 10') under inspection and moves the object in three-dimensional direction (See Fig. 7).

Lin ('674) discloses the claimed invention except for a monitor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Lin ('674) with the monitor since it was well known in the art that a monitor provides visual indication of the data, therefore allowing a user to manual look at the data so as to input threshold data which increases the ability to respond to different conditions during manufacturing and therefore reduces defects in the end product.



Lin ('674) discloses the claimed invention except for the circuit patterns existed on the object are included a plurality of different kind circuit patterns, spatial filter appropriate for each kind circuit pattern and spatial filter appropriate for a combination of some of said kind circuit patterns are provided so as to inspect a foreign matter/defect on the plurality of the different kind circuit patterns. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Lin ('674) with the different type of spatial filters since it was well known in the art that using different spatial filters allows the apparatus to inspect different types of circuits, therefore increasing the amount of circuit applications that can be inspected which increases inspection production.

4. Claims 15, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin ('674) in further view of Hasan (2002/0176074).

Claim 15

Lin ('674) discloses illuminating light (Fig. 5, Ref. 60) on an object (Fig. 5, Ref. 10) under inspection; detecting light (Fig. 5, Ref. 90) reflected from said object (Fig. 5, Ref. 10) and converting the detected light into an image signal by a detection optical system (Col. 8-9, lines 61-7); selectively shielding (Fig. 5, Ref. 28) diffracted light patterns coming from repetitive circuit patterns existing on the object (Fig. 5, Ref. 10) using a spatial filter (Fig. 5, Ref. 28) provided in the detection optical system, said spatial filter combining light-shielding points of minute dots state (Col. 8, lines 39-60); arithmetically processing (Fig. 5, Ref. 96) the image signal detected by said detection optical system (Col. 8-9, lines 61-7).

Lin ('674) in view of Hasan (2002/0176074) discloses the claimed invention except for a monitor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Lin ('674) in view of Hasan (2002/0176074) with the monitor since it was well known in the art that a monitor provides visual indication of the data, therefore allowing a user to manual look at the data so as to input threshold data which increases the ability to respond to different conditions during manufacturing and therefore reduces defects in the end product.

Lin ('674) substantially teaches the claimed invention except that it does not show an setting a plurality of recipes, which differ in intensity of the light to be illuminated on said object, polarized light of illumination light, illumination angle of illumination light, detection visual field size, or detection polarized light setting; wherein said observing step causes said

Art Unit: 2877

monitor to display foreign matter and defects on an individual recipe basis. Hasan (2002/0176074) shows that it is known to provide an ability to provide a plurality of recipes, which differ in intensity of the light to be illuminated on said object, polarized light of illumination light, illumination angle of illumination light, detection visual field size, or detection polarized light setting; wherein said observing step causes said monitor to display foreign matter and defects on an individual recipe basis (Page 5, Para. 0038) for an optical defect inspection apparatus. It would have been obvious to combine the device of Lin ('674) with the recipes of Hasan (2002/0176074) for the purpose of providing the ability to measure different sized defects on the surface of the object, therefore increasing the reliability of the measured data.

Claim 17

Lin ('674) substantially teaches the claimed invention except that it does not show an observing step includes a displaying step for displaying foreign matter/defect which is observed by the recipe set by setting step and emphasis indication of the foreign matter/defect to which its attention is paid. Hasan (2002/0176074) shows that it is known to provide an observing step includes a displaying step for displaying foreign matter/defect which is observed by the recipe set by setting step and emphasis indication of the foreign matter/defect to which its attention is paid (Page 5, Para. 0038-0039) for an optical defect inspection apparatus. It would have been obvious to combine the device of Lin ('674) with the displaying of Hasan (2002/0176074) for the purpose of providing the ability to mark defects on the surface of the object for a certain recipe, therefore creating a database of recipes which when used with later measurements increase the reliability of the measured data.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin ('674) in further view of Nara et al. (2001/0019411).

Claim 16

Lin ('674) discloses illuminating light (Fig. 5, Ref. 60) on an object (Fig. 5, Ref. 10) under inspection; detecting light (Fig. 5, Ref. 90) reflected from said object (Fig. 5, Ref. 10) and converting the detected light into an image signal by a detection optical system (Col. 8-9, lines 61-7); selectively shielding (Fig. 5, Ref. 28) diffracted light patterns coming from repetitive circuit patterns existing on the object (Fig. 5, Ref. 10) using a spatial filter (Fig. 5, Ref. 28) provided in the detection optical system, said spatial filter combining light-shielding points of minute dots state (Col. 8, lines 39-60); arithmetically processing (Fig. 5, Ref. 96) the image signal detected by said detection optical system (Col. 8-9, lines 61-7).

Lin ('674) in view of Nara et al. (2001/0019411) discloses the claimed invention except for a monitor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Lin ('674) in view of Nara et al. (2001/0019411) with the monitor since it was well known in the art that a monitor provides visual indication of the data, therefore allowing a user to manual look at the data so as to input threshold data which increases the ability to respond to different conditions during manufacturing and therefore reduces defects in the end product.

Lin ('674) substantially teaches the claimed invention except that it does not show an observing step includes an assigning step for assigning detection number IDs in accordance with foreign matter/defect position and displaying step for displaying size of the foreign matter/defect

assigned said IDs and category indicating a manufacturing process where the foreign matter/defect assigned said IDs is occurred. Nara et al. (2001/0019411) shows that it is known to provide an wherein said observing step includes an assigning step for assigning detection number IDs in accordance with foreign matter/defect position and displaying step for displaying size of the foreign matter/defect assigned said IDs and category indicating a manufacturing process where the foreign matter/defect assigned said IDs is occurred (Page. 19, Para. 0272) for an optical defect inspection apparatus. It would have been obvious to combine the device of Lin ('674) with the IDs of Nara et al. (2001/0019411) for the purpose of providing labels for each defect so that the defects can be stored in a database and used for future comparison with measurements, therefore increasing the accuracy of measured data.

Allowable Subject Matter

6. Claims 4-5, 10, 12 are allowed over the prior art of record.
7. Claims 8, 11, 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 4, the prior art fails to disclose or make obvious an inspection apparatus having a cartridge equipped with a plurality of substrates for forming said spatial filter; a cleaner which cleans said substrates of said cartridge; and a printer which prints the Fourier transformed image of the circuit pattern under inspection of the object onto the substrates of said cartridge,

Art Unit: 2877

and in combination with the other recited limitations of claim 4. Claims 5, 10, 12 are allowed by the virtue of dependency on the allowed claim 4.


Response to Amendment

9. Applicant's amendment filed 5/26/2006 placed claims 4-5, 10, 12 as allowable subject matter, but after further review examiner has determined that amended claims 6, 7, 9, 15-17 could be rejected in the prior art indicated above. Therefore, a new ground(s) of rejection has been provided.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Stafira whose telephone number is 571-272-2430. The examiner can normally be reached on 4/10 Schedule Mon.-Thurs..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Michael P. Stafira

Application/Control Number: 10/722,531
Art Unit: 2877

Page 10

Primary Examiner
Art Unit 2877

July 20, 2006